Kinetic Modeling Characterization of Cellulose Modified Surface for Methylene Blue Removal from Aqueous Media

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ABSTRACT
In this work, commercial cellulose is modified with allylthiourea (Cel-AT) to remove methylene blue (MB) from aqueous solution. Characterization study includes FTIR analysis along with UV spectrophotometer. A variety of physico-chemical properties such as kinetic, total sorption capacity loaded and pH effect by using Cel-AT sorbent is carried out. The main finding is the adsorption total capacity of Cel-AT for MB is three times more than commercial cellulose (Cel) when the concentration of MB increases in batch mode. In kinetic study, the MB removal efficiency is at 90% after 5 min of removal using Cel-AT as a sorbent and Cel-AT fulfil pseudo second order of reaction. The optimum MB removal is at pH 11 with 95% of removal. There is spectral peak which is observed in the spectrum of FTIR and it is addressed accordingly. As a conclusion, the suggested method improves the quality of MB sorption onto the Cel-AT in terms of contact time and less laborious. © 2021 Wiley-VCH GmbH

KEYWORDS
Adsorption; Cellulose; Dyes

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